

TREASURY DEPARTMENT.—U. S. MARINE-HOSPITAL SERVICE.

SANITATION AND PROGRESS.

BY

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[Address before Pan-American Medical Congress, Havana, Cuba, February 7, 1901.—
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*Mr. President, Members of the Pan-American
Medical Congress, Ladies and Gentlemen:*

Some four years ago at the meeting of this congress, in the city of Mexico, I had the honor of addressing you upon the subject of International Responsibility with regard to Epidemic Diseases. Quite in line with the thoughts then expressed, I have chosen for my subject tonight Sanitation and Progress, and it will be my effort to show the interdependence of municipal, national, and international effort in the great undertaking of the elimination of contagious disease, and that the twentieth century should witness this achievement.

Each morning I open on my official desk a package of newspaper clippings, received from the Bureau of Press Clippings in New York, containing notices of the prevalence of the several contagious diseases throughout the whole United States; and, as I note the wearisome recurrence of smallpox, diphtheria, typhoid fever, and scarlet fever, the notes upon consumption, the alarms concerning yellow fever and the bubonic plague, the thought which is impressed upon me is, How seriously are we lacking in proper effort in suppressing these *suppressible* diseases. Nothing seems easier to me than the prevention or suppression of smallpox. In vaccination we have an absolute preventive, and in the glycerinized lymph we have a safe inoculating material absolutely devoid of the danger of exciting undue inflammation. Thus a mere scratch or a needle puncture insures, without discomfort, protection from one of the most loathsome and disfiguring diseases known.

Even after smallpox has become epidemic, the methods by which it may be rapidly and surely suppressed have been so frequently demonstrated as to become now almost a matter of mere routine.

The antitoxin for diphtheria has long passed the experimental stage, and is now justly regarded as a specific—a trusty addition to the armamentarium of the physician and sanitarian.

In the treatment of the other diseases mentioned, we have for bubonic plague a specific cure and preventive, and are certainly on the verge of the discovery of specific remedies for both tuberculosis and typhoid

fever, but even without these specific remedies the nature of the diseases are thoroughly understood, and the methods of the prevention of their spread are accurate and well known.

Then why do these diseases persist? The answer is plain. It is that sanitary administration has not kept pace with scientific knowledge. It is also evident that this scientific knowledge is not so widely diffused as it should be, even among those of whom we have a right to expect it. It is evident that we are not making "use of those means which the God of nature has placed in our power."

SANITATION THE MOST IMPORTANT FEATURE OF GOOD CITY GOVERNMENT.

With regard to cities, there is a marked necessity of a strong public sentiment requiring that municipal cleanliness shall rank as one of the foremost features of municipal government. This is a field, not for the national Government, but distinctively for the States and municipalities, whose degree of sanitary excellence is a fair exponent of their civilization and culture; for each State and each municipality has, and will continue to have, a degree of sanitary excellence commensurate only with the demands of its own people.

We have here a striking illustration of the fact that our governments are governments *of* the people. It is, therefore, necessary to cultivate among the *people* a *demand* for municipal sanitary excellence; and as great an abhorrence of municipal filth, or neglect of sanitary engineering, as there is of uncleanly dwellings or of uncleanliness of person.

A good water supply, perfect sewerage and disposal of garbage, good street paving and street cleaning, should be the *first* boast of every municipality. Let *these* be pointed to with the pride which is commonly bestowed upon great public institutions and buildings. I see no reason why *slums* should be allowed in any city. *Relatively* speaking, too much attention is paid to public parks and handsome municipal buildings. The city's "improvements" should be in the alleys, around the docks, in the tenement-house quarters, and great as may be the appreciation of public art as manifested by statues and public gardens and of the parks and the boulevards let *these wait* upon the less showy but more important features of municipal life.

Recently I was on a board of three, the other two members being noted architects, to decide upon plans for the great Government Hospital for the Insane near Washington, Congress having appropriated \$1,000,000 for doubling the capacity of the present institution. In looking over the numerous plans and sketches submitted by the half dozen competitors, I was impressed with the promptness with which these two noted architects pounced upon all faults relating to light and ventilation, particularly of the lavatories, quickly throwing out as unworthy of further consideration those plans which placed the toilet rooms in dark or badly ventilated positions.

This illustrates the advanced modern idea, particularly when you reflect that these were formerly located in any dark or out-of-the-way place. So, too, in practical hospital work it has been my observation that dark closets are wont to be the repositories for old mops, rags, and dirt, so that it was my rule, when engaged in the management of hospitals, to paint the darkest and worst closets a pure white, making immediately perceptible the slightest trace of dirt or filth. The trouble I experienced with these closets soon vanished.

These illustrations will serve with regard to cities. The chief attention should be centered upon the *worst parts* of the city. The sewerage, paving, light, and ventilation of the *worst sections* should receive the first and most constant attention.

In support of this idea I quote from an article written five years ago by Dr. John S. Billings, who says:

"As regards Asiatic cholera, typhoid fever, various forms of diarrheal and dysenteric diseases, and diphtheria, our knowledge of their causes, means of communication and prevention is much in advance of the actual practice of most communities, mainly because the methods which are known to be effective to secure constantly pure water supplies and the satisfactory removal and disposal of refuse and excreta, require considerable sums of money to establish and maintain; and the public has not yet arrived at the conclusion that such expenditure is wise and proper, and that taxation for such purposes is necessary to secure the prosperity of a community.

"A very considerable part of the excess of death rates in a city is due to the poverty of the inhabitants of certain sections of it. In certain parts of all large cities there are to be found a number of people who are insufficiently fed and clothed and who are huddled together in such a way that cleanliness, decency, and morality are difficult or impossible to obtain. Here congregate the idle and intemperate, the tramps and loafers of the country, the hereditarily indolent and vicious classes. Mingled with them and living under much the same conditions are many honest and industrious people who are living from hand to mouth; the daily wage earners to whom sickness means recourse to the public hospitals and loss of means to earn their own subsistence. The death rates in these quarters are 50 to 150 per cent greater than those of the better class of population; the average duration of life is from ten to fifteen years less by reason of such poverty and squalor, a large part of their sickness must be relieved by public charity and one-third of those who die among them must be buried at public expense.

"The problem of how to improve the sanitary condition of these quarters to prevent the increase of foul, damp, dark, and overcrowded dwellings and thus lessen the burden of the community without still further pauperizing the people and attracting to the place other vagrants and criminals, is one of the most serious that confronts modern civilization and municipal government.

"It is easy to prove to any intelligent business man that high death and sickness rates in a city imply heavy demands on the public purse in the maintenance of hospitals and other charities, and also to show that an abundant and pure water supply, clean streets, good sewerage, and good and well-enforced building regulations are among the best means of lowering these death and sickness rates."

The foregoing quotation suggests a conviction which has long been forced upon my mind, that in all our sanitary work, both in municipal sanitation and in quarantine, we are working at the wrong end of the line. We are treating symptoms instead of the original cause of disease, and both for sociologic and economic considerations it would be far better to change the point of our attack.

Let me illustrate by the quarantine methods *heretofore* in vogue, and those *now* and in the *future* to be utilized in the suppression of an epidemic disease such as yellow fever. When yellow fever appeared in a given locality under the old dispensation, shotgun quarantines were established by near and remote localities having any possible communication therewith. The press dispatches announced that "Podunk," evidently priding itself on its vigilance, "has quarantine against the world," and other communities, not to be outdone by Podunk, followed suit. I do not mean to ridicule these measures, but how much wiser is the method now enforced of concentrating the restrictive efforts in the *neighborhood* of the *epidemic*, and how much wiser still will be those provisions of the near future which will enable any community, by reason of its good sanitary condition, to look with comparative equanimity upon the chance introduction or outbreak of a contagious disease.

And in our municipalities we build large public hospitals and establish other charitable institutions for the reception of the people whose unfortunate condition is attributable in large measure to the unsanitary conditions which our municipal governments allow to persist. As an economic measure, therefore, as shown by Dr. Billings, it will in the long run be *profitable* to spend more upon sanitation; and from a sociologic standpoint the advantages of this policy will be no less marked, for it must have occurred to most of my hearers in their hospital experiences that the greater the number of charity hospitals that are founded, the greater will be the number of people who are willing to become the recipients of charity; and that while charity is to be commended the zeal manifested therefor may, after all, bring unfortunate results, for "zeal without judgment is a fault, even though it be zeal unto good."

RELIEF FROM QUARANTINE.

Another strong appeal for sanitation lies in the promise which it would give of getting rid of quarantine. The time is at hand when we must consider the necessity of ridding ourselves of these restraints upon commerce, of holding a ship, with its valuable cargo and eager passengers, in quarantine because some person is aboard who has resided in a

filthy section of a foreign port and has brought with him an infectious disease. For these diseases can generally be traced to the overcrowded and otherwise insanitary sections of a city, the sections which, as I have before stated, should receive our first consideration. And the rich man held on board a steamer in the upper cabin because of infection aboard his ship in the steerage may reflect that his detention is due primarily to the faulty sanitation of some miserable portion of some foreign city ; and he receives thereby a demonstration of his personal interest in these conditions.

It is an interesting matter for conjecture, what would be the effect upon the prevalence of contagious diseases if there could be a complete wiping out of all the slums and low tenement house districts in all our cities. It matters not that an epidemic once started may prevail as violently, or more violently, in the better portions of the city, and that cleanliness and sanitation may then have but little effect upon its progress. The fact remains that for the perpetuation of these diseases among the people filth and bad environments are essential, and when we reflect how easy and natural is the upward gradation of infection, how readily, through successive grades, it may ascend the social scale from the lowest to the highest, the direct and personal interest of the wealthy and more intelligent classes of a community in the condition of the poor and ignorant becomes manifest. The greater danger of contagious diseases among the poor is recognized in the present United States Treasury Quarantine Regulations, providing for the inspection of vessels at foreign ports bound for the United States. These regulations require, under certain circumstances, the inspection of the steerage but not of the cabin passengers. We have made a class distinction, notwithstanding our democratic ideas, but the regulation is based on knowledge. It is a recognition of the fact that contagious and loathsome diseases are more apt to be prevalent among the poor, not simply because they are poor, but because they have been crowded and prevented from living under as good sanitary conditions as the more favored classes.

That good sanitary environment, enhancing the general health, is the best means of eliminating contagious disease, is illustrated by a conversation which I have had within a week with the director of the Hygienic Laboratory of the Marine-Hospital Service, Dr. Rosenau, who has just returned, after a prolonged period of study and investigation in the Pasteur Institute in Paris. Upon inquiring as to the latest phases of scientific investigation and the trend of thought at this great intellectual center, among other matters, he stated there seems to have arrived a period of pause in bacteriology, or at least a spirit of inquiry as to the true relation of microbes to the diseases of which they have been considered the special agents. Dr. Rosenau's statement is as follows :

"We have lately been compelled to modify some of our notions of the cause of contagious and infectious diseases. After the brilliant

discoveries by Pasteur and Koch it was thought that the presence of the pathogenic microbe organism was like the bite of a venomous snake, surely poisonous. But now we know that there are other conditions beside the presence of the microbe necessary to produce disease. Many people go about with virulent diplococci of pneumonia in their respiratory tract but do not have pneumonia. Why? Because their cells are vigorous enough to prevent the diplococci invading the lungs, but put such a person under bad sanitary conditions or depress his vitality and the microbes are not phagocytized—they invade the lungs and pneumonia and death follow.

"The same, to a limited degree, occurs with the bacillus diphtheriae.

"In times of cholera epidemics men go about with living, virulent, cholera vibrio in their intestinal canal, yet they are not sick. Why? Because the conditions for the production of the cholera toxins are not favorable—there is no abnormal flora in their intestinal canal. But let such a person eat poor and tainted food or derange his digestion through indiscretion or evil sanitary surroundings and the disease results.

"Many people live a long and active life with tubercle bacilli encysted in the apex of one lung. As long as they have plenty of fresh air and sunshine and good sanitary surroundings they remain well. But give such a person poor food or bad sanitary surroundings and see what happens. The battle going on between the bacilli and the cells results in a victory for the bacilli. The cells die and the victorious bacilli spread havoc through the lungs. We, therefore, have a scientific proof of the sense of the old-time notions of the old-fashioned doctors who taught the value of fresh air and sunshine, of good food and exercise, of cleanliness and dry dwellings, and we find that the conditions of health which result from such good sanitary conditions are, after all, among the very best preventives against infection."

SANITATION AND MUNICIPAL HONESTY.

Another good effect of sanitary excellence would be to obviate municipal deception either in the concealment of the existence of contagious disease or by reports giving a sense of false security to other communities. This subject is one which time will not permit me to discuss, but was treated of at some length in an address which I had the honor of delivering before the Social Science Association in Washington last May. I will simply say that the greater the neglect of sanitation, the more pronounced the disease-bearing factors of a city, the more sensitive does it seem to the acknowledgment of the presence of contagion, the more determined does it become in outright denial. It is thus seen, and it is by no means a matter of imagination, that municipal morality is affected by the municipal sanitary status.

SANITARY LEGISLATORS.

In the sanitary progress of the new century, it has occurred to me, there must be developed new classes of *individuals* in sanitary affairs

To-day every physician is considered, in a sense, a sanitarian; then there are the professional sanitarians, represented chiefly by those holding sanitary office; but there are very few men to-day engaged in legislation who give any thought to *sanitary* legislation. We need a class of men who are versed in the law, who are skilled in *framing* laws, and who are familiar with the difficulties and methods of securing their enactment. The *average* doctor or sanitarian is as a child in these matters. Impressed with the importance and nobility of his cause he becomes oblivious to the sentiments or even the rights of those affected unfavorably thereby. The same influences which seem to make of the doctor a poor man of business seem to make of the average sanitarian a poor man for legislation. So that it seems to me, at least in the United States, it will be necessary in the development of the ideal sanitary legislator to look for him among the lawyers rather than among the physicians. There is no reason why a good lawyer should not become adept in sanitation. I believe it to be more difficult for a good doctor to acquire legislative wisdom.

WEALTHY MEN AS SANITARIANS.

Another class of men to whom we should look for aid are the men of extreme wealth. I believe their attention should be directed to the vast amount of good to be done by the employment of their capital in backing up sanitary improvements. The number of great fortunes possessed by individuals in our several republics I have not had the opportunity of learning, but they are numerous; and so far as I can judge, their possessors, at least a large number of them, are imbued with generosity and a desire to utilize their great wealth for the public good. Witness the large number of universities founded by wealthy men, the public libraries and other institutions, erected or endowed by them; the contributions which they make in times of great calamity and in ordinary times to all charitable undertakings.

The methods by which they may assist in public sanitation may not be so obvious or numerous as other methods of advancing the public welfare, yet the influence of a man of great wealth could be distinctly felt in the advancement of sanitary legislation, and in the perfection of sanitary administration. Moreover, the use of large capital *in the improvement of the dwellings of the poor* appears to me to be as sensible and noble a method of the employment of capital as can be found. It has been a matter of surprise to me that the attention of our wealthy men of philanthropic impulse has not been more frequently thus directed. The Mills buildings, in New York, in a measure, illustrate this idea and I doubt not that a proper inquiry into the subject would develop other illustrations. But the advantage which individual capital enjoys over municipal government in the improvement of the dwellings of the poor lies in the difficulty experienced by the latter in condemning and destroying unsuitable tenements. Capital can *purchase*

them and erect good buildings in their stead. This is illustrated by the history of the Sanitary Improvement Company of Washington, a company formed, and now being successfully operated, for the erection of suitable habitations for the poor, with less thought of profit than of public benefaction. As originally outlined, the scheme included a condemnation by the Commissioners of the District of Columbia and a destruction of the condemned unsanitary buildings and the erection in their place of buildings by the Company, though owing to legal difficulties the necessary legislation for destruction has not yet been enacted.

In the recent press clippings I have read that statistics just compiled show that during the year just passed contributions to educational, religious, and charitable objects and institutions in the United States have amounted to almost \$61,000,000, donations of less than \$1,000 not being included in this summary. The article further states that this showing seems to indicate that there is a growing disposition to make philanthropy a partner to prosperity, a tendency to give helpfully instead of pauperizing men by benefactions. But in the list of these benefactions I see no mention of purely sanitary gifts or endowments, and to my mind it seems a reasonable proposition that more practical and beneficial results would have been obtained if this \$61,000,000, instead of being expended upon educational, religious, and charitable institutions, had been expended upon reclaiming the slums, and in the purchase and destruction of rookeries, with the erection in their stead of modern sanitary tenement houses, and that, too, even though the money had not been expended outright as a gift, but as a safe though moderately paying investment.

SANITARY TENEMENTS.

The need of sanitary tenements has been brought to the front by the recent agitation and widespread movement for the suppression of tuberculosis. In a pamphlet upon the tenements and tuberculosis by Dr. S. A. Knopf, of New York, appears the following statement : "The present condition of the tenement houses in this city is so serious, that the evils arising therefrom are a distinct menace to the welfare of the community. There are at present over 44,000 tenement houses in the old city of New York, and new tenement houses are being erected at the rate of about 2,000 a year. These are, in many respects, worse than the old buildings erected thirty years ago. They are badly constructed, and so planned that many rooms depend for their light and air entirely upon long, narrow, dark air-shafts, which, instead of giving light and air, are merely stagnant wells emitting foul odors and diseases."

It is true, gentlemen, that restrictive legislation may be enacted, but in view of all the foregoing facts can there be found a more useful method of employing great individual wealth than in the removal and the prevention of the erection of such houses by the substitution of those properly constructed.

In a recently published article by Charles R. Henderson, professor of sociology in the University of Chicago, on the spirit of modern philanthropy, the writer states that "Philanthropy has taken a wider and nobler view of its mission. It has become preventive and educational." He quotes the language of Miss Carpenter as follows: "A hospital can not cleanse a poison-infected district nor diminish the constant supply of patients from an undrained and malarious locality." He further says: "It is well to remove the weak and tempted from a bad environment, better still to improve the environment. It is well to go down to the folk-swamp and rescue one here and there; better still to drain the cesspool, improve the tenements, prevent adulteration of food and drink, inspect factories, and compel use of devices for averting accident and disease. The wall at the top of the dangerous precipice is worth far more than an ambulance at the bottom."

Since the above lines were written I have read a letter from a special correspondent (Marshal Lord) of the Washington Evening Star of January 19, showing the reformatory work of this character now going on in London, which should certainly stimulate all American municipalities to efforts in the same direction. The writer states: "Every American city big enough to have one of those municipal sores called a slum will doubtless be interested in the huge experiment London is undertaking. This is nothing less than the expenditure of \$10,000,000 in the wiping out and rebuilding the houses of about 40,000 people. A further program that means the expenditure of another \$10,000,000 is now being discussed, and after these projects are well under way, new schemes will be planned to the same end and more millions spent until the necessity for spending money in this way in London shall have disappeared and the city have become a landlord on an unprecedented scale. To-day the housing problem is the worst that London has to face, but her powerful county council, which has done several rather remarkable things already, and which has practically unlimited wealth to draw upon, has determined that overcrowded, insanitary, and slum areas must go. The county council has already attacked, razed, and rebuilt one of the worst slums in London. Several other notorious ones are now being torn down and still others are doomed. Medical inspectors in the county council's employ are penetrating into the city's filthiest corners and condemning them. The wretched creatures who swarm in them are paid a small sum of money and turned out, after which the slum goes down. The 'before taking' phase of the council's heroic remedy is a mass of closely packed hovels, squalid, unlighted, and unventilated, reached through grimy, winding alleys, in which the police dare to go only in force. The 'after taking' is blocks of trim cottages or apartment buildings, each separated from the other, equipped with literally every modern convenience, including a perfect system of drainage and every essential for cooking. The apartments are well lighted by day with large windows;

at night either by gas or electricity on the slot system, where a penny dropped in produces gas for six hours. These model dwellings, moreover, are to rent at prices which even very poor people can afford to pay and are immediately tenanted to their full extent. So far, on workingmen's homes of this pattern that occupy the place of former slum districts, the London county council has spent a little over \$3,000,000. It is now building houses which will cost over \$1,500,000, and to clear the new districts, which have been condemned and which are to be rebuilt, will cost \$5,500,000 more. The houses already built accommodate more than 10,000 people. Those now building and those arranged for will give dwellings to 30,000 more. They will be finished and occupied in five years from now.

"The second scheme which the council is laying out takes another way of curing the same disease of overcrowding. This is by acquiring tracts of land in the country just out of London, building model dwellings there and connecting them with the working centers of the city by light railways. This will probably cost \$10,000,000 more.

"The council began to rehouse on a modest scale in 1883, but the importance of its work to-day lies in the dimensions to which it has grown and its great promise for the future."

It is a significant fact, happily recalled at the present time, that the new King of England, Edward VII, was identified with the inception of this work. His maiden speech in the House of Lords in 1884 was in support of a motion in favor of the better housing of the poor, and he was subsequently one of the commission appointed to consider the matter.

Gentlemen, Representatives of the Western Republics, it is thus seen that our brethren of the East are already in the field. Why stand we here idle? Shall we in our newer territory allow ourselves to be surpassed in these matters by older governments, less democratic than our own, less dependent upon the will of the people?

In the foregoing I have endeavored to show that public sentiment, law, and administration are the most important factors for the attainment of our standard of sanitation.

SANITATION AND POLITICS.

One more word with regard to administration. The health officers selected under State or municipal law are too frequently subject to political change. An experience of one term of service is generally necessary to sufficiently acquaint the health officer with the duties of his office, and while political changes in other offices may be made possibly without injury to the public service the same can not be said with regard to an officer of the public health. He should be selected, also, solely on account of his ability or special adaptability for the position, and while every American citizen may be expected to be a politician,

in a certain sense, the health officer should be one who is not devoted to politics. And here is where the great body of the medical profession can exercise a salutary influence by taking an active interest in these appointments, insisting that men of character, of education and reputation, should receive them, for it is the duty of the profession to uphold the health officer in the performance of his public obligations. The health officer and the boards of health should command the respect and receive the support of the practitioners of medicine whose influence in this direction is all powerful.

One word at this point with regard to sanitation and politics. The city of Washington is sometimes referred to as typifying the highest order of sanitary equipment and administration, and when it has completed its sewerage system and established its water filtration plant it will be a model city. But, it may be argued, it is a model city because, unlike other cities, it has no local politics. This is true, but if municipal politics seem to interfere, as they often do, with sanitary progress, it but serves to demonstrate a reason, in addition to many other reasons, why the best men should go into politics.

NATIONAL AID TO MUNICIPAL SANITATION.

Now in the beginning of this paper I stated that municipal cleanliness and sanitation is not a field for the National Government, but belongs distinctively to the States and municipalities. Doubtless there is suggested to you, as to myself frequently, the thought of the National Government enforcing municipal sanitation. Speaking for the United States, under our Constitution, it is impossible. Nor with our ideas of self-government is it desirable. A weak leaning upon the National Government in ordinary matters affecting the people of a State or city is a thing to be avoided as lessening the feeling of municipal and personal responsibility for good government. The General Government does not go into cities and say what kind of reservoirs they must have, how their sewers shall be laid, and their garbage disposed of. These are left to local governments, which are just as capable for these measures as they are for managing their own police and fire departments.

SANITATION OF YELLOW-FEVER SEAPORTS.

Yet in the exercise by the General Government of its right to prevent the introduction of contagious diseases from foreign countries, or the spread of the same from one State to another, I can foresee the possibility of such national action as may, without objection, have an influence on the sanitation of cities. The sanitation of seaport cities which habitually breed yellow fever, with a view to eliminating this disease which interferes so seriously with commerce, is being considered by thoughtful men interested in commerce, sanitation, and diplomacy.

There is no one disease which interferes so seriously with commerce

in the Western Hemisphere or causes greater panic than yellow fever. The interdependence among nations in the efforts to get rid of this disease has become strikingly obvious, and illustrates the unity of interests of the nations in sanitation.

An inquiry into the sanitary conditions of the ports of the western republics will show with regard to many of them a woeful sanitary condition, a neglect of the first principles of sanitation, and either faulty or entire absence of quarantine protection of one city from another. The commercial relations between these places are each year becoming more intimate, and through correspondence and conversation with representatives of the Central and South American republics, I learn that the same apprehension which is felt by the United States each summer is experienced by all. All, or nearly all of our republics have suffered in their commercial and business prosperity through the visitation or threatened visitation of yellow fever, and I have been surprised by the instant approbation with which all with whom I have spoken have received the idea of an international agreement looking to the sanitation of such seaports as are habitually infected with yellow fever. That yellow fever can be rooted out of an old endemic focus, I believe; but to demonstrate it is not an easy matter. I have endeavored within the past two years, through special reports from the United States consuls, to collect facts showing the relation between sanitary improvements and the prevalence of yellow fever in the principal fever ports of the tropics, but the results are as yet underterminative. I believe, however, we have one notable illustration of success in Santiago, long known as a yellow fever port, but where the measures adopted by General Wood and the medical officers of the Army were so radical and thorough that no yellow fever now prevails or has prevailed during the past year in that city. I feel confident, too, that in due course of time, and that before long, yellow fever will be made to disappear altogether from Havana. The general death rate has already been reduced, according to Major Havard, from 46.71 1,000—the annual average for nine years—to 24.40 1,000 in 1900. Reasoning somewhat by analogy, we should be able to exterminate yellow fever from a given locality. A year ago last July it appeared in the National Soldiers' Home, Hampton, Va., where there were 3,500 veterans of the civil war, but it was stopped, and that, too, quickly, with a record of 45 cases and 13 deaths. In June, 1896, it appeared at McHenry, Miss., and in twenty days was entirely suppressed, after the occurrence of 20 cases in all.

In eliminating it, however, from a city or locality where it has prevailed for many years, there are four provisions which must be complied with: First. Effective sanitary administration. Second. Good sewerage and water supply, soil drainage, and paving. Third. Sanitary engineering of harbors. Fourth. The destruction or scientific disinfection of houses where the fever has prevailed. In Havana the first of these requisites has been and is being accomplished. The city is

clean on the surface. The sanitary administration is excellent, and measures are already under way for securing the second requisite of good sewerage, drainage, and paving. I do not know that it has yet been determined whether sanitary engineering is necessary with regard to Havana Harbor. But any harbor in the tropics which receives sewage and is so land-locked that it becomes a cul de sac must be subjected to such engineering as will cause a flow of its waters freely to the sea. But, even when all this is done, yellow fever will still prevail unless the fourth measure is enforced, namely, the destruction of old infected houses and the thorough scientific disinfection of others too good to be destroyed. In a tropical city a few years ago much stress was laid upon the good results following sanitary improvements of the harbor, but their improvements went still further, namely, to tearing down a large number of old houses, which was immediately followed by an unusual outbreak of yellow fever. In other cities, I have been informed, millions of dollars have been spent in improving the sanitary conditions, yet yellow fever prevails from time to time, and why? Because the houses are infected and have been for a great number of years.

This brings us to the question, Have we a simple and efficient means for a scientific disinfection on this broad scale? I believe that we have. To the Marine-Hospital Service, which has had so large an experience in the post-epidemic disinfection of cities and towns, the thought of a simple, clean, noninjurious, inexpensive, yet thorough disinfection of houses, after its experience with the carting around of steam chambers, the burning of sulphur, and washing down with bichloride solution and carbolic acid, and meeting the bills afterwards presented for ruin or damage of property—the thought comes as a welcome relief.

A few years ago, through the inventive genius of one of our officers, we believed we had a formaldehyd lamp which met every requirement, but experience demonstrated certain defects which caused its temporary abandonment. The intelligent mechanic who constructed the lamp, however, has so improved it that thus far it has stood every scientific and practical test to which it has been put, and I hope and believe that in this lamp we have an efficient, simple, and safe method of evolving formaldehyd gas of a strength to insure a thorough disinfection of houses and public buildings. I mention this matter as one of encouragement in the idea of eliminating yellow fever under the terms of the fourth requisite which I have mentioned, from cities usually infected.

INTERNATIONAL AGREEMENT.

The plan of international agreement which was outlined in an article by myself in the Forum for February, 1899, contemplates a convention to be composed of public sanitarians, civil engineers, and financiers, whose duty it should be to prepare a treaty providing for the examination of the chief yellow fever ports by a commission representing the republics concerned. Each country should obligate itself to put into

effect the measures recommended by this commission, or measures of its own which should meet with the commission's approval. Since obligations without penalties, would be worthless, the treaty should provide that if after a sufficient time these improvements are not made, each of the other nations interested should impose such discriminative tariff or tonnage tax or quarantine restraint upon the offending nation as would cause it in its own interests to comply with the terms of the treaty.

Since the publication of the Forum article, I have conversed upon the subject with a number of the representatives of the Central and South American republics, and with representative public men of our own country, and without exception all have pronounced the idea both valuable and practical. (a)

If this measure should become an accomplished fact, think of the stimulation which, through international influence, would be given to municipal sanitation everywhere. Dr. Kober, in his excellent address on the Progress and Achievements of Hygiene, gives in detail the beneficial results of the sanitation of European cities. In providing for sanitation of seaports on account of yellow fever, the cities would undoubtedly benefit with regard to other diseases, and there is no doubt that as a result their commercial prosperity would be so enhanced that other cities would take notice and profit by their example.

Standing on the threshold of the twentieth century and looking forward to its achievements, the foregoing thoughts appear to lose the elements of doubt which may at first seem to attach to them, particularly when we look back upon the achievements of the past century in medicine, in surgery, and in sanitary science. And when we study the achievements of other centuries of the past and see how they have been filled with the more primitive struggles for individual and national freedom ; with the evolution of physical and mental science ; with the development of architecture, painting, sculpture, and literature, it would seem that the next great cause pressing for agitation, both for the amelioration of unhappy conditions and for the further advancement along the lines of previous study and development, is the cause of sanitation. It is the next step for progress in the destinies of man, for "elevation in the scale of being." For further intellectual and moral advancement sanitation is indispensable. Progress in other matters will in a measure depend upon it. The movement is already begun. Witness the sanitary benefactions of George Peabody in London thirty-eight years ago, and the efforts of the London County council, as previously narrated, and similar work in Liverpool, Glasgow, Paris, and Brussels ; the valuable report of the New York tenement-house commission of 1894, and the labors of the present commission ;

^a A resolution, embodying the main features of the plan as outlined above, was adopted by the Pan-American Medical Congress on motion of Dr. Eduardo Wilde, Argentine Minister to the United States and Delegate to the Congress.

the report of Surg. Gen. John M. Woodworth, U. S. M. H. S., to the International Medical Congress in 1876 ; the resolutions of the conference of sanitary officers at Montgomery, Ala., in 1899, and the American Public Health Association in 1896 ; the report of the Department of Labor of the United States upon the investigation of slums, under the authority of an act of Congress, and the innumerable contributions upon these subjects to the daily and medical press. All the above relate to the subjects which have just been under discussion, and the time has come for more positive action. The twentieth century will certainly demonstrate the brotherhood of man, the fraternity of nations, and, not excepting even the Peace Conference at The Hague, there can be no more hopeful sign of promise than is held out by sanitation.

Here is a common field upon which the nations may meet with unselfish and common purpose ; here is a policy which may well be put in the platforms of political parties, and which, by requiring intelligent legislation, will bring the best men into local politics ; a policy which will put a rifle groove in the shotgun now loaded with spasmodic municipal reforms, good-government clubs, and crusades against vice, and weld these latter into one missile of definite direction and force. Here is a means by which the rich may help the poor without further pauperizing them ; a cause which, if advocated, will break down unnecessary class distinction ; a promise of greater public morality ; an assurance of higher life and greater health and prosperity to all, embodying in it the *summum bonum* of human existence, "the greatest good to the greatest number."

